cular, and fibrous layers of the latter. The subcuticular layer is in most instances difficult to be distinguished; but in one species of *Polynoë* I find that certain vesicular appendages scattered over the surface of the elytra show distinctly beneath the delicate cuticle a layer of polygonal squames, and in the interior a series of fibres which radiate from the base of the vesicle to its outer wall, and may represent the fibrous layer of the wall of the scale, or may be special nerve-endings.

(4) The sexual products reach the exterior through apertures in the bases of the parapodia; and the ova are carried by ciliary action to the under surface of the scales, where they remain, adhering by means of a viscid matter, till the embryos are well advanced. Impregnation probably takes place while the eggs are in this situation; and I have found still crowding in great masses under the scale embryos which had reached the advanced cephalotrochous stage first described by Sars* in *Polynoë cirrata*.

Sydney, July 1, 1882.

XXII.—*Note on* Keramosphæra, *a new Type of Porcellanous Foraminifera.* By HENRY B. BRADY, F.R.S.

[Plate XIII.]

TOWARDS the end of last year I received from the 'Challenger' office a little white spherical Foraminifer, accompanied by a request that I would identify the species. I was then far from home, and without any better means of examining the specimen than that afforded by a simple magnifying-glass, viewed by which it appeared to be nothing more than a rather fine example of the globular variety of *Tinoporus* (*Gypsina*)—somewhat larger than usual for a recent specimen of that genus, but inferior in size to some of those found in the fossil condition, and scarcely so regular in contour. Owing to absence from England, I had no immediate opportunity of reverting to the subject, and had scarcely thought again about it, until a few weeks ago, when, in conversation with Mr. Murray, I learnt that the specimen had been sent to me because it appeared to differ in important particulars from *Gypsina*, and also because it was found at much greater depth than usually affected by that type. At the same time he placed in my hands another similar shell, which had been obtained by further search in the same batch of material. The result of the examination of these two specimens I propose to give in few words; and it is only necessary to state at the outset that they have been found to illustrate a type of foraminiferal structure not previously described, though closely related to certain well-known porcellanous forms.

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* "Zur Entwickelung der Anneliden," Archiv für Naturg. 1845, pp. 11–19.

The two organisms to which allusion has been made are, or rather were, spherical tests of $\frac{1}{10}$ and $\frac{1}{11}$ inch (2·5 and 2·3 millim.) diameter respectively, of milky-white colour and porcellanous texture; the entire surface was areolated or "blistered," the areolæ somewhat irregular in outline, each apparently corresponding to a single chamberlet. The general appearance of the larger of the two, as seen under a magnifying-power of 25 diameters, is excellently given in Pl. XIII. fig. 1, *b*. A transparent section, as nearly central as possible, was subsequently made of the same shell, portions of which, more highly magnified, are shown in figures 3 and 4. The smaller specimen, laid open by a particularly happy fracture, is accurately portrayed in figures 2, *a* and *b*.

The general arrangement of the test is easily understood by a comparison of these various drawings. They show that it is composed of chamberlets arranged in more or less regular concentric layers, that the chamberlets are convex on their outer surface, and that they vary somewhat in size and shape, but not to such an extent as to interfere with a tolerably symmetrical plan of growth.

To determine the minute structure with any degree of completeness, and especially the nature of the communication that subsists between the chamberlets, would require a number of sections made on different planes, which cannot be obtained without a larger supply of specimens; nevertheless, with the help of allied organisms, the anatomy of which is well known, the available material is sufficient for the elucidation of all the more important and characteristic features.

A preliminary examination brings one fact into prominence, namely the close analogy that exists between the arrangement of the chamberlets in the sectional view and that found in the genus *Orbitolites*; indeed there is scarcely any portion of the section to which a counterpart may not be found amongst the figures which accompany Dr. Carpenter's memoir on the latter type*. It must, of course, be borne in mind that the section of a spherical test does not, like the horizontal view of an Orbitolite, present a series of chamberlets grouped on one level, the whole of which, together with their means of intercommunication, can be seen at one time, but is rather the view of a plane projected through a mass of chamberlets so arranged that they are necessarily intersected at different angles.

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* Phil. Trans. 1856.

It may be noticed that although the section (fig. 3) passes through nearly the centre of the shell, it does not show any distinct primordial chamber. It is probable, therefore, that the initial chamber is of small size, perhaps scarcely distinguishable from the chamberlets, as is often the case in Orbitolites of the simple type. The early layers are comparatively thin and the constituent chamberlets small; and either for this reason or because the central portion of the section happens to be thicker than the rest, the structure appears somewhat confused.

Referring to fig. 4, which represents a portion of the section near the periphery, much more highly magnified, it will be seen that the communication between the successive layers is maintained by tubular orifices, *a*, *a*, *a*, *a*, one at the margin of each chamberlet, and that these orifices are set obliquely close to the line of union with the contiguous chamberlets. In the external layer they serve collectively as the general aperture of the test, and correspond to the peripheral pores of the Orbitolite; but they are not so conspicuous on the exterior, owing to their peculiar position and oblique setting. The chamberlets of the successive layers are neither regularly alternating, as in the simple Orbitolite, nor directly superimposed; and although there is a certain degree of uniformity in their relative positions, they are too variable in size and shape to conform to any rule in this particular.

The communication between the chamberlets of the *same* layer is maintained by short lateral stoloniferous tubes, which are less easy to identify than those uniting the *successive* layers already described. They are shown, in section, in fig. 4, *b*, *b*, *b*, *b*. Under favourable conditions one such opening is found near each end of the chamberlet; and as a section only shows one side of the chamberlet, there is probably a lateral orifice communicating with *each* contiguous chamberlet.

Notwithstanding a certain analogy to the genus *Orbitolites*, it is manifest that the organism described in the foregoing paragraphs represents a very distinct and independent type of Foraminifera. I propose to constitute a new genus for its reception, with the name *Keramosphæra* (κέραμος, porcelain, and σφαῖρα, a globe); and I am gratified to be able to associate with the species the name of Mr. John Murray, F.R.S.E., the present editor of the 'Challenger' Reports, by whom my attention was first directed to it, and by whose leave this preliminary notice is published. The following characters will serve for its distinction, pending the discovery of additional species.

Keramosphæra Murrayi, nov. gen. et sp.

Test free, porcellanous, spherical; formed of concentric layers, each consisting of a large number of chamberlets arranged more or less regularly in single series. Chamberlets of the same layer communicating with each other by short lateral stolons; those of the successive layers by the pores which formed the superficial apertures of the previous layer. Aperture consisting of numerous pores, one at the margin of each chamberlet. Colour white; surface areolated by the outlines of the somewhat convex chamberlets of the peripheral layer. Diameter about $\frac{1}{10}$ inch (2·5 millim.).

The specimens were found in material dredged during the 'Challenger' expedition at "Station 157, March 3, 1874; lat. 53° 55′ S., long. 108° 35′ E.; depth 1950 fathoms,"—a locality, roughly speaking, about five and twenty degrees south of the south-western corner of Australia. The material brought up was a nearly white, feathery-looking, diatom-ooze, composed chiefly of Diatomaceæ, Radiolaria, sponge-spicula, and other siliceous organisms; and the first point to be determined with reference to the specimens under consideration was that they were really calcareous. Foraminifera were not very numerous, about seventeen species in all; and the general aspect of the Rhizopod-fauna was distinctly arctic, except that the calcareous forms were, as a rule, somewhat thin-shelled.

EXPLANATION OF PLATE XIII.

Fig. 1. *Keramosphæra Murrayi*, nov. *a*, natural size; *b*, magnified 25 diameters.

Fig. 2, *a*, *b*. Another specimen laid open by fracture, showing the general internal structure. Magnified 20 diameters.

Fig. 3. Portion of a nearly central section of the specimen shown in fig. 1. Magnified 50 diameters.

Fig. 4. A smaller portion of the same, magnified 100 diameters, showing *a, a, a, a,* the orifices communicating between the chamberlets of the successive layers; *b, b, b, b,* lateral orifices communicating between the chamberlets of the same layer.

XXIII.—*Undescribed Rhopalocera from the Malay Peninsula.*

By W. L. Distant.

Lycænidæ.

Polyommatus (*Cyaniris*) *Lambi*, n. sp.

Male. Wings above somewhat dark lavender-blue; anterior wings with the costal area and outer margin somewhat